

**We claim:**

1. An intervertebral connection system comprising:

a) a ligament having:

- i) a central portion,
- ii) first and second end portions, and
- iii) first and second conformable portions,

wherein the first conformable portion is disposed between the central portion and the first end portion, and the second conformable portion is disposed between the central portion and the second end portion

b) first and second shoulderless bone fasteners,

wherein the first end portion is shaped to cooperatively connect to the first bone fastener, and the second end portion is shaped to cooperatively connect to the second bone fastener.

2. The system of claim 1 wherein the ligament is bioresorbable.

3. The system of claim 1 wherein the bone fastener comprises an attachment end portion, wherein the attachment end portion has a shape for fitting a driver.

4. The system of claim 1 wherein each bone fastener further comprises an insertion end portion, wherein the insertion end portion is drivable.

5. The system of claim 1 wherein at least one of the central and conformable portions is tensionable.

6. The system of claim 5 wherein the tensionable portion is braided.

7. The system of claim 1 wherein the central portion is tensionable.

8. The system of claim 7 wherein the central portion and conformable portions each have a length, and the length of the central portion is at least twice as long as either conformable portion.

9. The system of claim 1 wherein at least one of the central and conformable portions is extensible.

10. The system of claim 9 wherein the extensible portion is braided.

11. The system of claim 1 wherein the central portion is extensible.

12. The system of claim 11 wherein the central portion and conformable portions each have a length, and the length of the central portion is at least twice as long as either conformable portion.

13. An intervertebral connection system comprising:

a) a ligament having:

- i) a central portion,
- ii) first and second end portions, and
- ii) first and second conformable portions,

wherein the first conformable portion is disposed between the central portion and the first end portion, and the second conformable portion is disposed between the central portion and the second end portion,

wherein the width of the conforming portion is smaller than the width of the central portion.

14. The system of claim 13 further comprising:

b) first and second bone fasteners,

wherein the first end portion is shaped to connect to the first bone fastener, and the second end portion is shaped to connect to the second bone fastener, and

wherein the width of the first end portion is substantially the same as the width of the bone fastener head.

15. The system of claim 13 wherein the width of the conforming portion is at least 1.5 times smaller than the width of the central portion.

16. The system of claim 13 wherein the width of the conforming portion is at least 3 times smaller than the width of the central portion.

17. An intervertebral connection system comprising:

- a) a conformable ligament comprising first and second end portions, and
- b) first and second bone fasteners,

wherein the first bone fastener is located at the end of the first end portion.

18. An intervertebral connection system comprising:

- a) a conformable ligament comprising first and second end portions, and
- b) first and second bone fasteners,

wherein the first bone fastener is integrally connected to the first end portion of the ligament, and the second bone fastener is integrally connected to the second end portion of the ligament.

19. An intervertebral connection system comprising:

- a) a ligament comprising first and second end portions, and
- b) first and second bone fasteners,

wherein the first bone fastener is connected to the first end portion of the ligament, and the second bone fastener is connected to the second end portion of the ligament, and wherein the first bone fastener is configured to accept a driver.

20. The system of claim 19 wherein the first bone fastener has an upper surface connected to the first end portion of the ligament, and the upper surface has a recess.

21. The system of claim 20 wherein the recess houses a rescue screw.
22. The system of claim 19 wherein the upper surface has a circumference, and the second end of the ligament portion attaches to at least half of the circumference.
23. The system of claim 19 wherein the upper surface has a circumference, and the second end of the ligament portion attaches to substantially the full circumference.
24. The system of claim 18 wherein the first bone fastener comprises a shank and lateral protrusions protruding from the shank.
25. The system of claim 22 wherein at least one of the lateral protrusions defines an angle  $\alpha$  of no more than 45 degrees.
26. The system of claim 22 wherein at least one of the lateral protrusions defines an angle  $\alpha$  of no more than 30 degrees.
27. The system of claim 22 wherein at least one of the lateral protrusions defines an angle  $\alpha$  of between 20 degrees and 30 degrees.
28. The system of claim 22 wherein the shank has a diameter D, and at least one of the lateral protrusions has a height H, and the height H of the lateral protrusion is no more than 70% of the diameter D of the shank.
29. The system of claim 18 wherein the end portion of the ligament has a width  $W_L$  and at least one bone fastener has a width  $W_{BF}$ , and  $W_L$  is no more than  $W_{BF}$ .
30. An intervertebral connection system comprising:
- a conformable ligament comprising first and second end portions, and
  - first and second bone fasteners,

wherein the first bone fastener is connected to the first end portion of the ligament, and the second bone fastener is connected to the second end portion of the ligament.  
wherein the bone fastener is bioresorbable and is shoulderless.

31. A kit comprising

a) an intervertebral connection system comprising:

- i) a ligament comprising first and second end portions, and a central portion disposed therebetween, and having at least one bioresorbable portion, and
- ii) first and second bone fasteners,

wherein the first bone fastener is shaped to cooperatively connect to the first end portion of the ligament, and the second bone fastener is shaped to cooperatively connect to the second end portion of the ligament, and

b) a motion disc having a first height,

wherein the central portion of the ligament is bioresorbable and has a length, and wherein the length of the central portion is no less than the height of the motion disc.

32. The system of claim 31 wherein the bioresorbable ligament is selected from the group consisting of a polymer and a copolymer.

33. The system of claim 31 wherein the bioresorbable ligament comprises a textile.

34. The system of claim 31 wherein the bioresorbable ligament is tensionable.

35. The system of claim 32 wherein the bioresorbable ligament is conformable.

36. An intervertebral connection system comprising:

- a) a conformable ligament comprising first and second end portions, and
- b) first and second bone fasteners,

wherein the first bone fastener is pre-connected to the first end portion of the ligament, and the second bone fastener is pre-connected to the second end portion of the ligament.

37. The system of claim 36 wherein the pre-connection is accomplished by physical locking.

38. The system of claim 36 wherein the pre-connection is accomplished by physical connection.

39. The system of claim 36 wherein the pre-connection is accomplished by integral connection.

40. An intervertebral connection system comprising:

a) a compressible ligament comprising first and second end portions and having at least one bioresorbable portion, and

b) first and second bone fasteners,

wherein the first end portion is shaped to cooperatively connect to the first bone fastener, and the second end portion is shaped to cooperatively connect to the second bone fastener.

41. The system of claim 40 wherein the ligament further comprises a bioresorbable central portion.

42. The system of claim 40 wherein the ligament further comprises a central portion, and conformable portions disposed between the central portion and each end portion, wherein each conformable portion is bioresorbable.

43. The system of claim 40 wherein each end portion is bioresorbable.

44. The system of claim 40 wherein each bone fastener is bioresorbable.

45. The system of claim 40 wherein the bioresorbable portion is selected from the group consisting of a polymer and a copolymer.

46. The system of claim 40 wherein the bioresorbable portion is selected from the group consisting of PLA, PGA and copolymers of PLA and PGA.

47. The system of claim 40 wherein the bioresorbable portion is a copolymer comprising PLA and PGA.

48. The system of claim 47 wherein the copolymer comprises between 70 wt% and 99 wt% PLA, and 1 wt% and 30 wt% PGA.

49. A intervertebral connection system comprising a ligament having a central portion having a thickness of between 0.5 mm and less than 2 mm.

50. The system of claim 49 wherein the central portion has a thickness of between 0.5 mm and 1.5 mm.

51. The system of claim 49 wherein the central portion has a thickness of between 1.0 mm and 1.5 mm.

52. The system of claim 49 wherein the central portion has a thickness of between 1.0 mm and 1.2 mm.

53. The system of claim 49 wherein the central portion has a tensile strength of at least 500 N.

54. The system of claim 49 wherein the central portion is bioresorbable.

55. The system of claim 49 wherein the bioresorbable central portion is selected from the group consisting of a polymer and a copolymer.

56. The system of claim 49 wherein the bioresorbable central portion is selected from the group consisting of PLA, PGA and copolymers of PLA and PGA.

57. The system of claim 49 wherein the central portion is compressible.

58. An intervertebral connection system comprising:

- a) a compressible ligament comprising first and second end portions, and
- b) first and second bone fasteners,

wherein each bone fastener and the ligament are bioresorbable.

59. The system of claim 58 wherein the ligament and each bone fastener has a resorption time, and wherein the resorption time of the ligament is less than that of each bone fastener.

60. The system of claim 58 wherein the ligament is tensionable.

61. The system of claim 58 wherein the bioresorbable ligament is selected from the group consisting of a polymer and a copolymer.

62. The system of claim 58 wherein the bioresorbable ligament is selected from the group consisting of PLA, PGA and copolymers of PLA and PGA.

63. An intervertebral connection system comprising:

- a) a ligament having:
  - i) a central portion,
  - ii) first and second end portions, and
  - iii) first and second conformable portions,

wherein the first conformable portion is disposed between the central portion and the first end portion, and the second conformable portion is disposed between the central portion and the second end portion

- b) first and second shoulderless bone fasteners,

wherein the first end portion is connected to the first bone fastener, and the second end portion is connected to the second bone fastener, and



wherein the central portion is made of a first material having a first resorption time, the end portion is made of a second material having a second resorption time, and the first material has a shorter resorption time than that of the second material.

64. An intervertebral connection system comprising:

- a) a compressible ligament comprising first and second end portions, and
- b) first and second bone fasteners, each bone fastener having an attachment end comprising a ceramic material and a shank comprising a polymer material.

65. An intervertebral connection system comprising:

- a) a ligament comprising first and second end portions, and
- b) first and second bone fasteners,

wherein the first end portion is pivotally connected to the first bone fastener, and the second end portion is pivotally connected to the second bone fastener.

66. A kit comprising:

- a) an interbody device having a height, and
- b) an intervertebral connection system comprising a ligament having a length, wherein the ligament length is between 1 and 3 times the height of the disk prosthesis.

67. An intervertebral connection system comprising:

- a) a ligament having:
  - i) a central portion,
  - ii) first and second end portions, and
  - iii) first and second intermediate portions,

wherein the first intermediate portion is disposed between the central portion and the first end portion, and the second intermediate portion is disposed between the central portion and the second end portion, and

- b) first and second shoulderless bone fasteners,

wherein the first end portion is shaped to cooperatively connect to the first bone fastener, and the second end portion is shaped to cooperatively connect to the second bone fastener, and

wherein at least one of the central and intermediate portions is extensible.

68. The system of claim 67 wherein the extensible portion has a length which can be increased by 25% without exceeding its yield point.

69. The system of claim 67 wherein the extensible portion comprises a textile.

70. The system of claim 67 wherein the extensible portion is a braided yarn.

71. The system of claim 67 wherein the central portion is extensible.

72. The system of claim 67 wherein the central portion and conformable portions each have a length, and the length of the central portion is at least twice as long as either conformable portion.

73. An intervertebral connection system comprising:

a) a ligament having:

- i) a central portion,
- ii) first and second end portions, and
- iii) first and second intermediate portions,

wherein the first intermediate portion is disposed between the central portion and the first end portion, and the second intermediate portion is disposed between the central portion and the second end portion, and

b) first and second bone fasteners,

wherein the first end portion has an upper surface, a lower surface and a first transverse hole therethrough, the hole having a shape for receiving the first bone fastener, and the second end portion has an upper surface, a lower surface and a second transverse hole therethrough, the hole having a shape for receiving the second bone fastener, and

wherein the first bone fastener is received within the first transverse hole, and the second bone fastener is received within the second transverse hole,  
wherein the intermediate portions are conformable and made of a braided material, and  
wherein the upper surface of each end portion is smooth.

74. The system of claim 73 wherein the bone fastener is a screw.

75. The system of claim 73 wherein the upper surface of the first end portion is integral with the first conformable portion.

76. The system of claim 73 wherein the upper surface of the second end portion is integral with the second conformable portion.

77. An intervertebral connection system comprising:

a) a ligament having:

- i) a central portion,
- ii) first and second end portions, and
- iii) first and second intermediate portions,

wherein the first intermediate portion is conformable and is disposed between the central portion and the first end portion, and the second intermediate portion is disposed between the central portion and the second end portion,

b) a first shoulderless bone fastener, and

c) a shouldered bone fastener,

wherein the first end portion is shaped to cooperatively connect to the first shoulderless bone fastener, and the shouldered bone fastener is received through the second end portion.

78. A method of stabilizing a pair of vertebrae, each vertebrae having a surface, comprising the steps of:

a) providing an intervertebral connection system comprising:

i) a ligament having first and second end portions, and

ii) first and second bone fasteners,

wherein the ligament is between the first and second bone fasteners, the first end portion of the ligament being adjacent the first bone fastener, the second end portion of the ligament being adjacent the second bone fastener, and

b) fully inserting the first bone fastener and at least a portion of the first end portion of the ligament into the first vertebra to a location below the first vertebral surface, and

c) fully inserting the second bone fastener and at least a portion of the second end portion of the ligament into the second vertebra to a location below the second vertebral surface.

79. The method of claim 78 wherein the first and second vertebrae form a portion of a first lateral aspect of a scoliotic spine having a convex curve, the first bone fastener is inserted into the first lateral aspect of the first vertebra and the second bone fastener is inserted into the first lateral aspect of the second vertebra, and the insertion step of step c) tensions the ligament, thereby at least partially straightening the convex curve.

80. A method of stabilizing an intervertebral discal region between an upper and a lower vertebra, the upper vertebra having a higher cancellous bone region, a lower cortical bone region and a first transition region therebetween, the lower vertebra having an upper cancellous bone region, an upper cortical bone region and a second transition region therebetween, comprising the steps of:

a) providing an intervertebral connection system comprising:

i) a ligament having first and second end portions, and

ii) first and second bone fasteners,

wherein the first end portion is shaped to cooperatively connect to the first bone fastener, and the second end portion is shaped to cooperatively connect to the second bone fastener, and

b) inserting the first bone fastener into the first transition region of the upper vertebra, and

c) inserting the second bone fastener into the second transition region of the lower vertebra.